Planning Considerations for Over Snow Movement

Terminal Learning Objective

Action: Plan for over snow movement

Condition: You are a small unit leader, given the requirement to move your unit over snow covered terrain.

Standard: Plan a 5 km over snow movement for a squad sized element with a solution plus or minus one hour.

172D 21 INF
B-34

POLARIS

M973 Small Unit Support Vehicle

Individual Movement Techniques

- ***Skiing***
- ***Snowshoeing***
- ***Skijoring***

Use Skis When...

- ***Long distances must be traveled***
- ***Stealth is necessary***
- ***Conditions allow***

Military Skiing

Military skiing:

- ***is generally done on flat or rolling terrain that requires the use of cross-country (Nordic) skills.***
- ***may require skiing down steep slopes using downhill (Alpine) skills.***
- ***presents a major training challenge because of the time it takes to train Soldiers to be proficient on skis.***
- ***is divided into seven ski lessons.***
- ***is an excellent alternative means of conducting physical training in winter***
- ***is an excellent means to giving Soldiers practical experience dealing with the cold weather environment***

Military Ski Lessons

Ski Lesson 1: Nomenclature, Maintenance, Fitting, Introduction to Movement on Skis

Ski Lesson 2: Hill Climbing and Gentle Descents

Ski Lesson 3: Basic Cross-Country

Ski Lesson 4: Wedge Turns; Intermediate Cross-Country

Ski Lesson 5: Basic Nordic Downhill

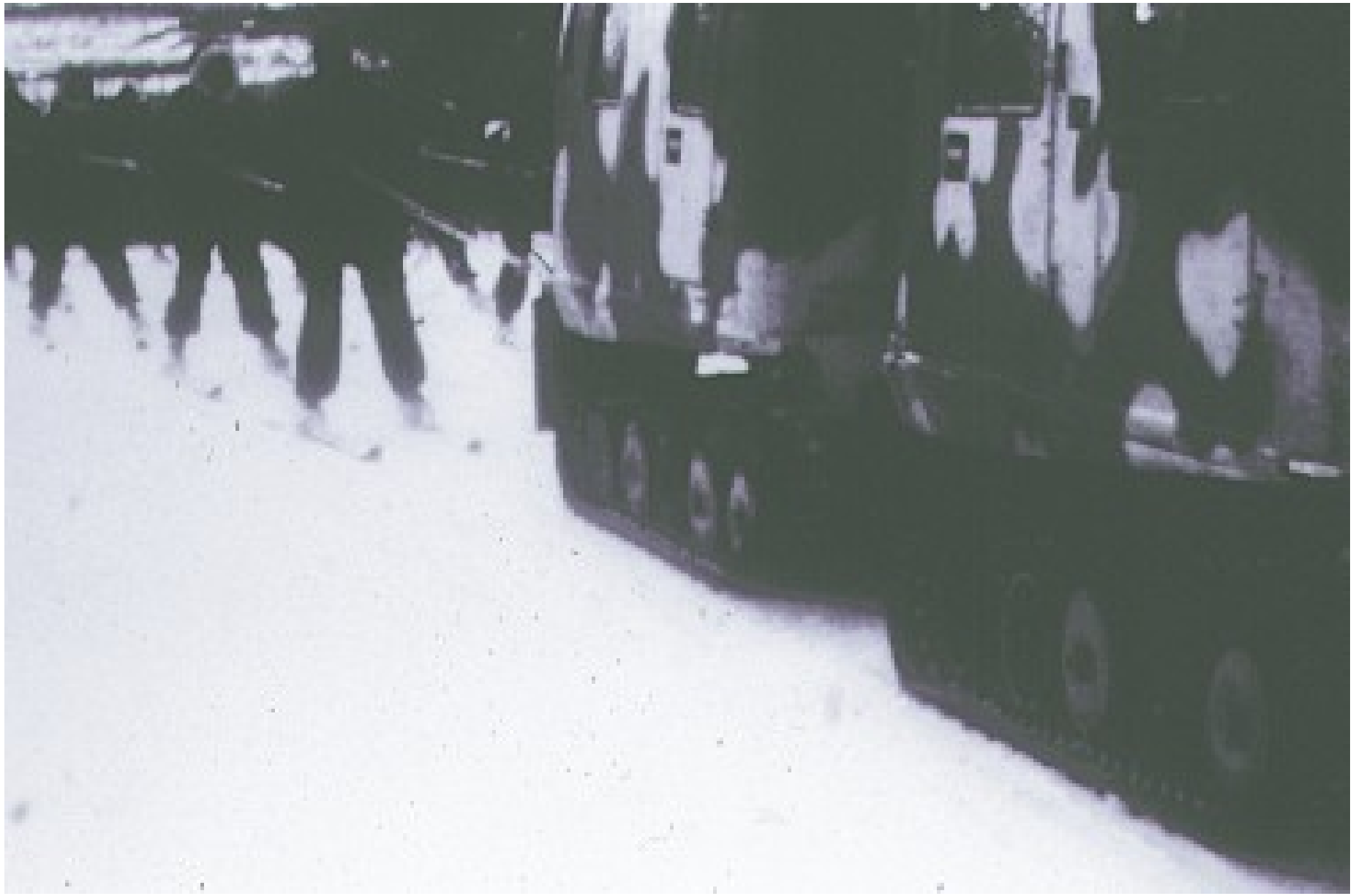
Ski Lesson 6: Intermediate Nordic Downhill, and Advanced Cross-Country

Ski Lesson 7: Advanced Nordic Downhill

Skijoring

- ***is a technique that uses a vehicle to tow skiers***
- ***requires a minimum of 40 hours of ski training prior to skijoring; Soldier must be proficient on skis***
- ***requires a written risk assessment by the commander***
- ***generally uses SUSV or snow machine***
- ***vehicle speed is limited to 15 miles per hour***
- ***all skin must be covered; goggles are required***
- ***for SUSV, a spotter is used to observe skijoring personnel***
- ***spotter must have communication with driver***

Skijoring



Use Snowshoes When…

- ***Moving through heavy brush***
- ***Terrain is rough***
- ***Troops are not proficient with skis***

Snowshoeing

Have soldiers move over snow covered terrain:

- ***The feet are kept apart slightly wider than normal to prevent stepping on or catching the other snowshoe.***
- ***The toe of the snowshoe is raised just high enough with each step to clear the snow as the tail slides over it.***
- ***On flat and gentle slopes ascent is made by climbing straight uphill***
- ***Steeper terrain is ascended by traversing and packing a level trail similar to a creating a shelf across it.***
- ***Ski poles may be used as an aid to balance, especially when carrying heavy loads and/or moving uphill.***
- ***Movements***
  - ***Walking***
  - ***Step turn***
  - ***Kick turn***
  - ***Negotiate obstacles***

Route Planning Considerations

In addition to the tactical situation consider:

- ***Map recon for route selection; feasibility of route during limited visibility***
- ***Movement technique (skis, snowshoe, foot)***
- ***Soldiers Load***
- ***Use of vehicles***
- ***Terrain and Weather***

Route Planning Considerations: Open Terrain

- ***Break only one set of tracks***
- ***Follow tree lines/natural terrain features***

Route Planning Considerations: Hills / Mountains

- ***Use gentle traverse to ascend or descend***
- ***Follow contours once elevation is gained***
- ***Avalanche considerations***

Route Planning Considerations: Water Routes

- ***Generally excellent for navigation***
- ***Check ice thickness***
- ***Stay close to shore or bank***
- ***Overflow***

Load Bearing Capacity of Fresh Water Ice

Minimum Ice Thickness (Waterborne)			
Load	***Minimum One Time Only***	***Normal Repeated Use***	***Distance Between Units***
Soldier on skis	**1.5 inches**	**2 inches**	**5 meters**
Soldier on foot	**3 inches**	**4 inches**	**5 meters**
¼ ton truck	**5 inches**	**8 inches**	**16 meters**
HMMV	**10 inches**	**13 inches**	**27 meters**
SUSV	**10 inches**	**13 inches**	**27 meters**
UH-60/CH-47	**15 inches**	**18 inches**	**80 meters**

Route Planning Considerations: Night Movement

- ***Breaks in contact and long halts can cause cold weather injuries***
- ***Route must follow easiest possible terrain***
- ***Route must be well marked***

Trail breaking on skis/snowshoes

- ***can take considerable effort; personnel must be rotated out frequently***
- ***second Soldier does not step in leaders footprints; helps flatten trail***
- ***third and fourth Soldiers help widen trail by off-setting left and right***

Planning Rates of March

Movement Mode and

Movement Mode	Unbroken Trail	Broken Trail
On foot- less than one foot of snow	1.5 to 3 kph	2 to 3 kph
On foot- more than one foot of snow	.5 to 1 kph	2 to 3 kph
Snow Shoeing	1.5 to 3 kph	3 to 4 kph
Skiing	1.5 to 5 kph	5 to 6 kph
Skijoring	N/A	8 to 24 kph

(expected rates of march for troops carrying rucksacks over gently rolling terrain)

Effects of Terrain Angle on Speed

Uphill-

Add 1 hour for every 1000 foot increase in elevation

Downhill-

Add 1 hour for every 1600 foot decrease in elevation

Practical Exercise

Your mission is to conduct a deliberate attack. The distance from your LD to assault position is 5 km.

Your route follows a unbroken trail crossing two ridge lines. The first is 550 feet above the surrounding terrain; the second is 450 feet.

There are 18 inches of snow on the ground. Your troops are proficient on snowshoes but not on skis.

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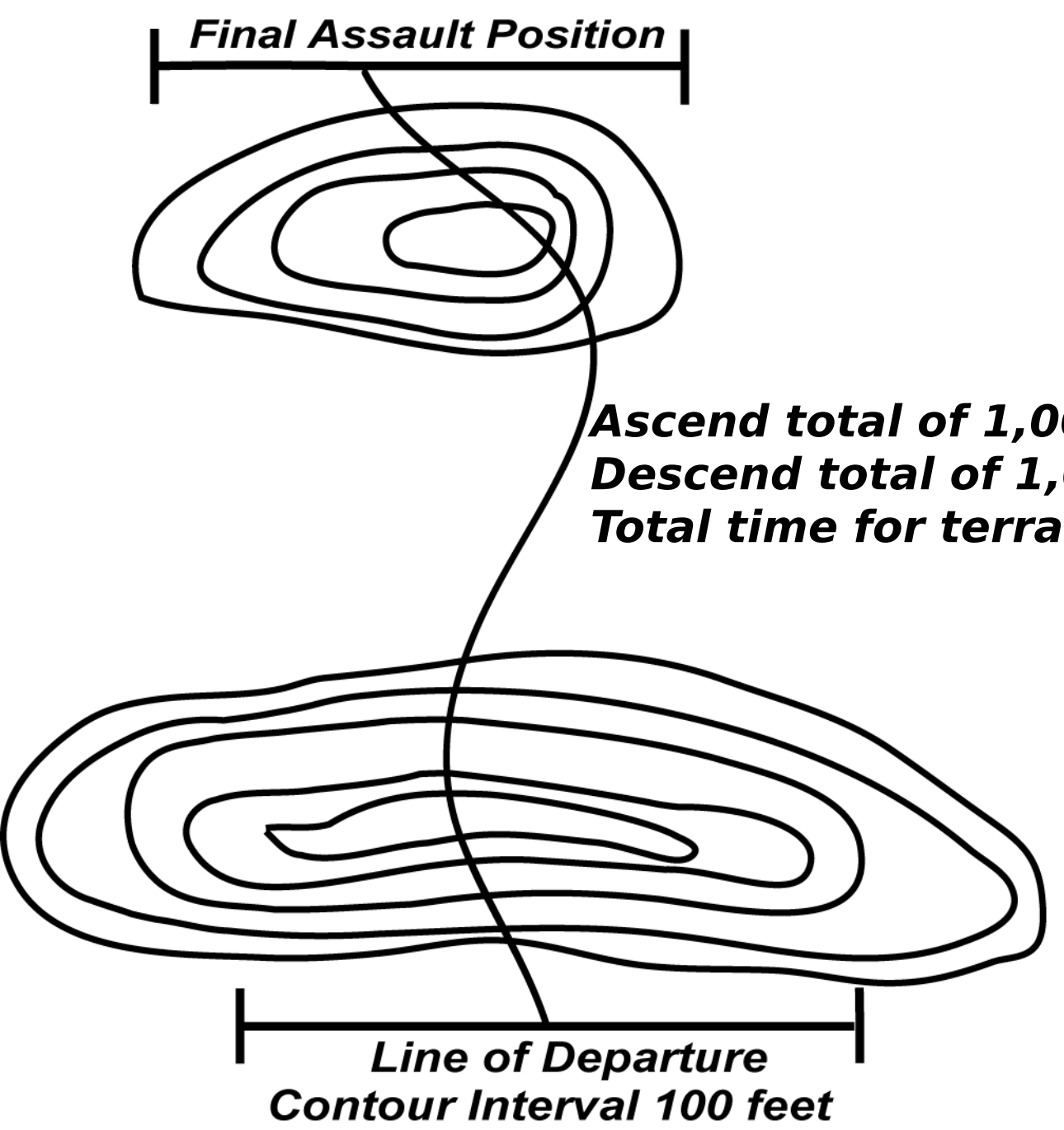
Final Assault Position
Ascend total of 1,000 feet: Add 1 hour
Descend total of 1,000 feet: Add 40 min
Total time for terrain factor: 1 hour 40 m
Line of Departure
Contour Interval 100 feet

PE Solution

- **5K on 18 inches of new snow on snowshoes**

  3 hours and 20 minutes (1.5km/hr) +

- **"Terrain factor" - (effect of hills)**

  1 hour and 40 minutes

  = 5 hours

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